

Hobbies

WEEKLY

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Kill rats and other vermin with this CATAPULT GUN

THIS is both an interesting and useful article to make, and can be used for target practice or execution amongst rats and other vermin. It is an improvement on the old-fashioned catapult, being used in the same manner as a gun. Small shot or stones are used as ammunition, being projected from the gun with considerable force.

The stock, Fig. 1, can be cut from a piece of 1in. or $\frac{3}{4}$ in. deal or hardwood, 3ins. wide and 2ft. long. Hardwood is decidedly better than deal if a piece of the right size can be obtained. Cut it to the shape shown in the diagram, round off the edges of the butt and those parts underneath which are gripped by the fingers when the gun is in use.

Trigger Opening

At 10ins. from the butt end square lines across, $1\frac{1}{2}$ ins. apart. Between these chisel out a mortise $\frac{3}{8}$ in. wide for the trigger to move in—shown in the drawing by dotted lines across.

At the opposite end of the stock, at 1in. in, cut a groove across $\frac{3}{4}$ in.

wide and $\frac{1}{4}$ in. deep for the crossbar A to fit that carries the ends of the elastic operating the catapult. This is cut to the dimensions given from a piece of hardwood, and a groove $\frac{3}{8}$ in. wide and $\frac{1}{4}$ in. deep is cut out on the under side.

Crossbar Assembly

Fix the crossbar in with glue and a small screw, and near each end of it bore a small hole and drive in a screw-eye to which the ends of the elastic can be tied.

Having cut the mortise for the trigger, as at B, Fig. 2, next cut out a slot, or groove, $\frac{1}{4}$ in. deep and wide extending from the bottom of the mortise to where the thick part of the barrel ends, as at C. In this groove a length of elastic, or a spring will lie, which is added to pull the trigger forward again after firing the gun.

This groove is indicated by a dotted outline in B to make its direction plainer. At the end of the groove (C) a small nail is driven through, as shown, to which the spring, or elastic, can be fastened.

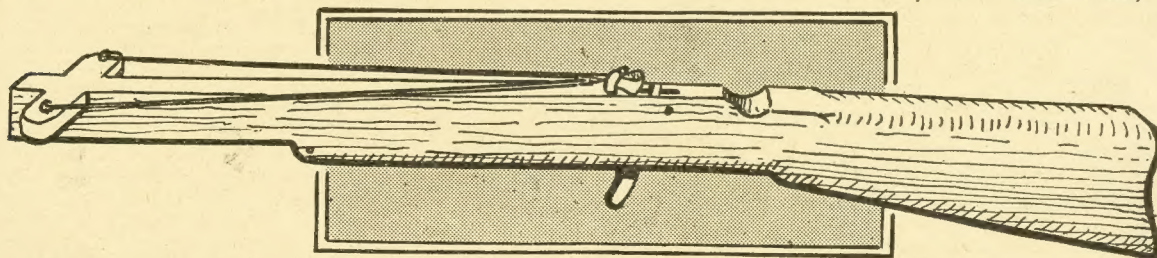
The trigger is shown at Fig. 3, and is cut to the shape shown from $\frac{1}{4}$ in. thick fretwood. If a rectangle is marked on the fretwood to size given, the shape can be easily copied. At the front, just 1in. from the bottom, drive in a small screw-eye for the opposite end of the trigger spring to be fitted to.

As this spring is to lie in the groove already cut for it in the gun stock, take care the screw-eye is placed to be just opposite the groove when the trigger is in position.

Trigger Pivot

At the right hand top corner bore a small hole, and bore similar holes through the gun stock, going through the mortise. Then with a nail pushed through to act as a pivot, and the trigger in place of course, the trigger should be free to move quite easily. Attach the spring or elastic to the trigger, and to the nail at the opposite end of the groove, to pull the trigger forward after being pulled back with the fingers.

A stop (D, Fig. 2) is cut from a stout piece of sheet metal, long



All correspondence should be addressed to The Editor, Hobbies Weekly, Dereham, Norfolk.

enough to reach across the gun stock, and, say, $\frac{1}{4}$ in. wide. This is fixed across the rear half of the mortise and will prevent the trigger rising above the mortise.

Get a piece of thin paper and on it strike an arc with the compasses set

little judicious filing should make all right.

Go over the woodwork with glass-paper and make everything smooth, then stain walnut colour and apply a coat or two of clear varnish to improve appearance and make a work-

and cut it into two equal lengths. For holding the shot a piece of soft leather will be best, $\frac{1}{4}$ in. wide and about 3 ins. long. The elastic is firmly fixed to the ends of this with a binding of twine, and the free ends of the elastic tied to the screw-eyes on the

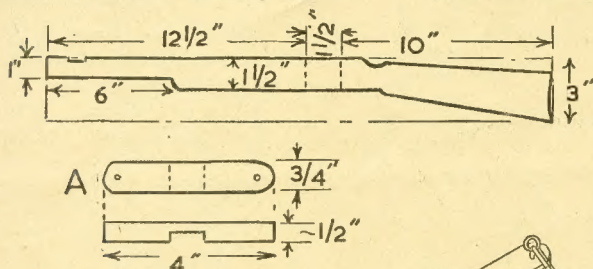


Fig. 1—Outline of stock, barrel and crossbar

to a radius of $1\frac{1}{2}$ in. Without shifting the point of the compass strike a second arc, $\frac{1}{2}$ in. inside the first one. Make the ends of the arcs 70 degrees apart, as at E. Stick this on to a piece of fairly stout metal and cut out.

Two of these will be needed and they are fixed, one to each side of the trigger, as shown by the dotted outline. The trigger should be temporarily withdrawn for this fitting. Now refix the trigger in place, and see it acts satisfactorily and does not tend to stick anywhere. If it does, a

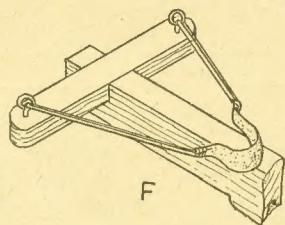


Fig. 4—Action of the elastic and sling

manlike and realistic weapon. Be sure to round off all angles where held by the fingers to secure a comfortable grip when "firing" the gun.

Get about a yard of catapult elastic

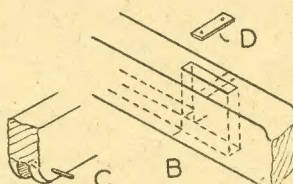


Fig. 2—Trigger action groove

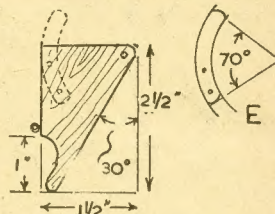


Fig. 3—The trigger

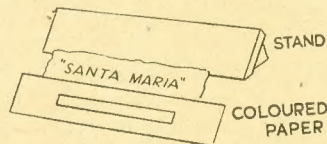
crossbar, as at F, Fig. 4. All is now ready for operating the catapult gun.

Place a shot, or small stone, in the leather pouch and draw it back until the pouch can be pushed down between the brass extending strips of the trigger, as at G, where it should be securely held. On pressure of the trigger the pouch will be released and the shot expelled by the elastic with some force.

A word of warning—a catapult gun can inflict a nasty bruise if its shot strikes anyone, so remember to handle it as a weapon and do not be tempted to point it at anyone, even in fun. In short, don't lark about with it.

Label for Models

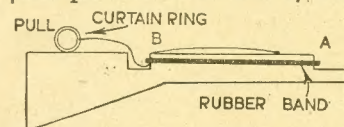
A NEAT finish to fretwork models is a "label" and here is a simple way of making one. From a piece of fancy paper cut a slot in the centre



slightly larger than the name required. Glue it on the paper bearing the name of the model which is printed in Hobbies so that only what you wish to indicate is shown. Glued to a thin strip of card or wood with the necessary stand at the back, you have a good finish to the job.

Elastic Gun

A N excellent elastic gun can be made with these materials. One piece $\frac{1}{2}$ in. thick wood 8 ins. by 2 ins.



One piece thin white string 8 ins. long, one curtain ring and a rubber band. For the rubber band you can easily cut $\frac{1}{4}$ in. strip off an old bicycle tube. The picture shows the construction

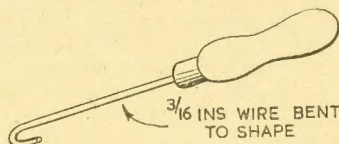
of the gun. For loading, put the rubber over the slot A and stretch over to slot B. Trap the string so that when it is pulled, the rubber band flies off.

Cleaning Wheels

W HEN cleaning an awkward article such as the wheels of bicycles or perambulators, an old tooth brush is very useful for reaching the small spaces satisfactorily.

Glue Kettle Tip

I F your glue-kettle handle gets hot when heating your glue, a simple tip is to obtain an old tool handle and



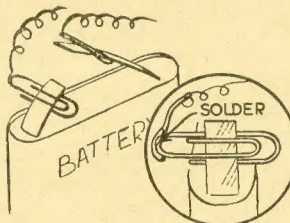
a piece of $\frac{3}{16}$ in. wire about 10 ins. long. Shape it in the form of a small hook and then fit it into handle from an old chisel or file.

Sawing a Board

W HEN ripping a long board, place a wedge of wood or a chisel in sawcut. As you saw, move the wedge further down the cut. This eases the saw and allows it to run quite freely.

A Handy Clip

W HEN fixing electric bells and other small electric devices where a pocket battery is being used,



it is very useful to have a paper clip handy to fix on to the battery prongs, as shown. It is much better than just twisting the connecting wires round and round, hoping they will not come off.

Hole Filler

H OLES in the wall made by nails or where the plaster has been removed, can be filled without expense. Tear up an old newspaper into small pieces and put into a bowl containing a few scraps of soap and boiling water. After soaking for a few minutes squeeze out and mix the pulp with a little cold potato until it has become like glue. Fill the holes with the mixture and when dried, paint over with a little whitening and soap mixed together.

An amazing number of everyday articles can be MADE WITH WIRE

THE fashioning of articles out of wire of one type or another is a definite handicraft and as a hobby has much to recommend it. The work is clean and simple in operation, but at the same time it gives plenty of scope to anyone who is artistic and imaginative. Also it is not expensive and the tools required are few.

Wire can be purchased from any ironmongers, where (like nails) it is sold by the lb. It is described as this

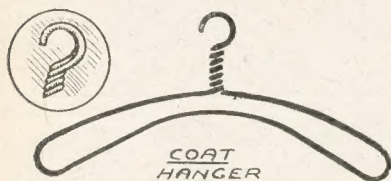


Fig. 1—A simple coat-hanger

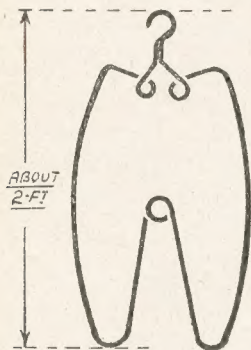


Fig. 2—Spring extenders for trousers

or that gauge, which really means diameter. As the number of the gauge increases so the diameter decreases. Thus, a 14 gauge wire is of less diameter than a 12 gauge. Quite a number of metals are employed in manufacture—brass, steel and copper being the most common—each having its advantages and disadvantages.

Wire can also be obtained in nickel-covered steel and certain alloys, while both square and round sections are produced—the round cross-section, of course, being the more popular.

There are several wire gauges and here are some of the wires that will be most useful to the home wire-worker in the Imperial Standard:—

Gauge 9	— .144in. diameter.	
" 10	— .128in.	"
" 11	— .116in.	"
" 12	— .104in.	"
" 13	— .092in.	"
" 14	— .08 in.	"
" 15	— .073in.	"
" 16	— .064in.	"

For most household articles—like the almost proverbial toasting fork—a 14 gauge wire is the best, this being a shade under a tenth of an inch in diameter. For things like coat-hangers a stiffer wire must be used. Brass or steel (nickel-covered) are the most suitable metals to work with. Copper is far too soft and lacks that slight spring which is essential to good wire-fashioning.

A length of thin copper wire is useful, however, for working out "first patterns" as it can be bent, straightened and bent again *ad lib*, although it becomes very wavy in the process. But as a maker of first patterns from which the final articles are shaped in brass or steel it is ideal.

Wire to Use

Brass and steel wire, if possible, should only be bent once, hence the advisability of a first pattern which can be adjusted till it is "exactly right". From it accurate measurements can be taken and marked on the final material.

Brass and nickel-covered steel work out at about 3/- per lb. cost, and a lb. represents about 135 feet, so one can afford to be quite liberal with it. Actually a good supply of wire should be kept to hand as articles have a knack of taking rather greater lengths than a first survey would suggest—this being a further reason for a "first pattern"—estimation of length.

It is also good to have a little wire to hand of lesser and greater gauges than the material mainly used. This is because a piece of differing gauge can often be worked into an article with advantage, as say a stiffer length put in as the core of a handle of some item which will have to withstand a fair weight. Or a fine piece which can bind two heavier gauges together at some point where they cross.

Simple Tools

Tools required for wire-work are a pair of "flat-nosed" pliers and a wire-cutter. If desired, the two can be obtained in the same tool. A few pieces of circular wood are handy for bending wire round. Also a nail or two standing upright in a heavy piece of wood for the same purpose. Some persons think a glove while working wire a great boon—if not too thick.

Having got everything ready let us now consider

some of the things that can be made with wire. The number of articles that can be so made is truly remarkable, extending well beyond the usual toasting fork, etc., and a few items are outlined here.

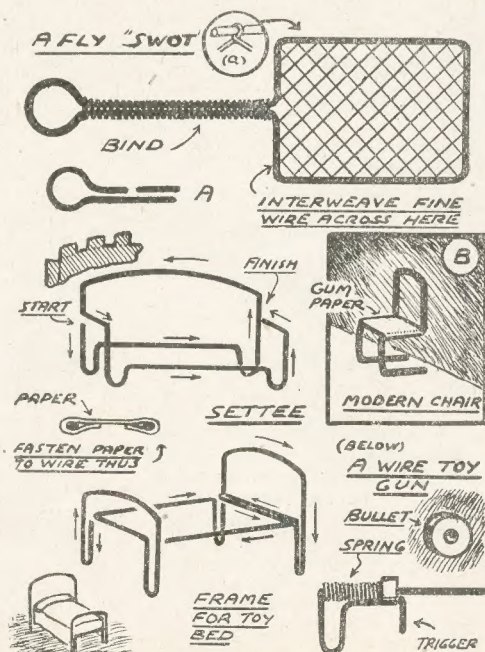
Hangers and Creasers

Coat-hangers, for instance, fashion well out of a single length of stiff wire. The shape is shown in Fig. 1. Starting with lower strand the wire is bent back on itself at a normal shoulder width, the bends being rounded. At the mid points the two ends are turned upwards and twisted together to form the upright piece, the hook at the top completing the article.

Sketch 2 shows a frame for keeping the creases in trousers. Two frames are of course required and they are inserted, one in each leg, there being sufficient spring in the wire to press well into the creases and both retain and give shape.

About 12 gauge wire should be used and the various loops, which are there to give a certain amount of extra springiness, must be shaped round something circular. A hardwood ruler or a suitably-sized length of metal rod are suitable. The frames are finished with hooks at the top so the trousers with frames inserted can be hung.

The third sketch shows five things which can be made with wire. First there is the "fly swot". The frame, which must be of fairly stiff wire, is



Another range of simple articles made from wire

one continuous piece with the shank and loop at the top. The ends of the length are brought together a little way down the side of the shank as (A). Fine wire is used for interweaving the net at the rectangle end. The wire is threaded backwards and forwards across and given a twist as (a) every time the side is reached. At the intersections the wire is passed alternately above and below to form a strong mesh. The shank is bound as indicated with a medium-sized wire.

Doll's Furniture

Some doll's furniture on previous page is made with wire frames covered with that gummed paper which one buys in rolls from the stationer. Quite a number of items can be constructed but only a settee, bed and modern chair are shown here.

The frames are one piece of wire in each case, the arrows showing how it follows round in the cases given. The

completed frame is then covered with gummed paper, taking the edges of the paper over the wire and gumming it to itself on the under side. Where the paper has to fit over a curve, as the top of the settees, little tabs are cut, as shown, to allow the curve to be comfortably taken.

If a seat or a back does not seem firm enough it can be reinforced with an extra layer of paper simply gummed on top. Where possible, gum side, seat and end pieces together along the edges that meet. The settee looks more finished with a roll of cloth on the seat to give the impression of cushions.

The wiring for the bed is a little more complicated, but the path of the length can be quite well seen in the diagram. Here only the flat of the bed needs covering, the ends being left open. The model should be finished with a roll of cloth on the bed and

another piece hanging over to look like a coverlet.

Modern furniture is particularly easy to fashion and a chair in the modern style is shown. Settees and tables are just as easy to make.

A Spring Gun

Finally, in the bottom corner is a quite attractive wire gun. Required are a length of stiff springy wire to make the main shape indicated, a small coil spring and several "bullets" which, as will be seen are merely round pieces of wood with a hole in the centre which will fit the wire.

The wire just at the top of the trigger rises into a small catch which holds the bullet. Pressing on the trigger pulls down this catch and the spring, which has been compressed to get the bullet in position, sends the piece of wood forward at a high speed. The spring can be made or bought from an ironmonger.

Some worthwhile hints and tips for THE NEW CYCLIST

EACH springtime brings a number of new recruits to the great army of cyclists. We do not marvel at this, for you cannot imagine a better pastime, or a more enjoyable one during the long spring and summer.

Its advantages are many. There is no tax to pay, no driving test to pass, no "fuel" to buy for the machine; miles and miles of open road are there for your benefit; all the most interesting bits of countryside can be explored a-wheel at small cost.

To the new recruit we would give the following hints. See your machine is of the best make, just right in size and for comfort. Adjust saddle and handlebars to obtain a really comfortable position. There is more in this than meets the eye, for it makes all the difference when you come to go on a long tour.

When satisfactory adjustments of handlebars and saddle have been achieved, maintain that position, remembering that it may take a little time to get "settled down" to the correct seating.

The Question of Distance

The new rider should exercise sensible discretion at first. The distance to be covered must not be too far, nor the pace too fast. Never go "all out". It is in your power to "cut your coat according to your cloth". In short, keep within your physical abilities and strength. If you are thinking of joining a cycling club, get plenty of practice before you set off with a party of fellow-members on a long day's ride.

Start with short, leisurely spins, gradually increasing the distance, but

not the speed. Well has it been said that it is "the pace, not the distance, that kills". Commencing with short spins, the beginner is invariably attracted to the joys of longer runs, then week-end trips, and finally a long summer holiday tour.

That is a good way of approaching the climax—the tour a-wheel in some beautiful region of Britain covering a fortnight or so. The main thing is to prepare oneself on a systematic basis before setting out on the eagerly anticipated holiday.

Here are points to remember—

- (1) Keep your machine in a clean and tip-top condition.
- (2) Keep your tyres well inflated; never ride on a flat tyre.
- (3) Carry a repair outfit.
- (4) Do not start out without your wallet, identity card, your money for the outing, and your map.
- (5) Do not leave your machine propped up against shop windows or in any dangerous position. Do not park it in some public place for a long time and then expect to find it there—someone else may take a fancy to it. If it is necessary to leave your machine unattended for any length of time—or even for a few minutes, for that matter—then place a lock on it. A padlock and chain is cheaper than having, maybe, to buy a new bike.
- (6) Go slow round corners, and always observe the rules of the Highway Code, which it is advisable to study carefully.
- (7) Do not be ashamed to walk up steep hills or to dismount for an occasional rest.
- (8) Do not try to ride hour after hour

on an empty stomach. Your body must have fuel. But avoid alcohol, and very heavy meals when riding.

- (9) Do not drink too much between meals when in the saddle. To indulge in too frequent drinks is to court disaster.
- (10) Dress sensibly. Follow the example of experienced touring riders in this matter. Wear easy cycling shoes that allow the ankles full play.

On Tour

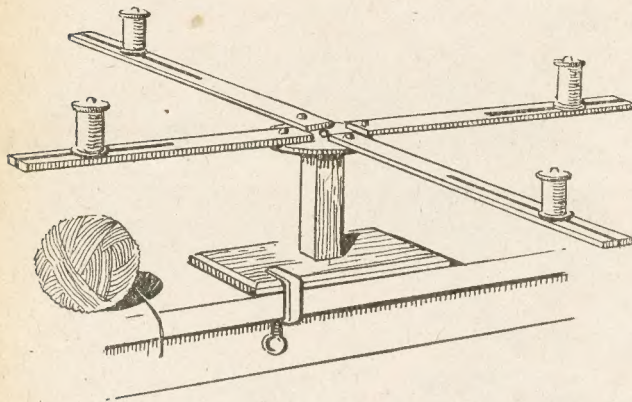
When the happy moment arrives for you to sally forth on that first long tour, remember these things. See that man and machine are both "tuned up" and in good condition. Keep your luggage down to the minimum, cut it down to the last ounce. Do not ask yourself: "What shall I take?" but rather "What can I leave behind?" Just the bare necessities should be made to suffice.

Go easy at the start—you have the long day before you, and no one will cry if you do not travel fifty miles before lunch! Curb your energies and you will find a benefit from this before the afternoon is out.

Companionship on the road is desirable; but choose someone who is in the same case as yourself—a beginner with certain limitations. You can join the novices' section of a local cycling club if you wish; you will surely meet with one or two fellows likely to prove boon companions.

Make your plans ahead and book accommodation if you can. As an alternative, the Youth Hostels afford excellent facilities to members. The C.T.C. is also very helpful to those who join.

A pleasing gift for any lady who knits would be this FOLDING WOOL-WINDER



HERE is another type of simple wool-winder which can be made up at very little expense.

It is designed, too, to fold, and so takes little storage or cupboard space. The winder consists of an oblong base with an upright attached to it, and a capping piece to take the four arms. The arms are slotted at their outer ends to take the spools which slide up and down in the grooves to allow for different size skeins of wool.

In Fig. 1 we see the completed winder open and ready for winding another ball of wool. The four arms are attached to the platform on top of the upright by means of short bolts fitted with nuts and washers.

Easily Dismantled

In this way, if it is desired to dismantle the whole thing it can easily be done by just unscrewing the nuts. The platform too can be removed from its upright by the removal of a simple pivot pin or screw through its centre.

In Figs. 1 and 2 we show respectively the winder open and closed, the four nuts shown being simply tightened up when the arms are extended.

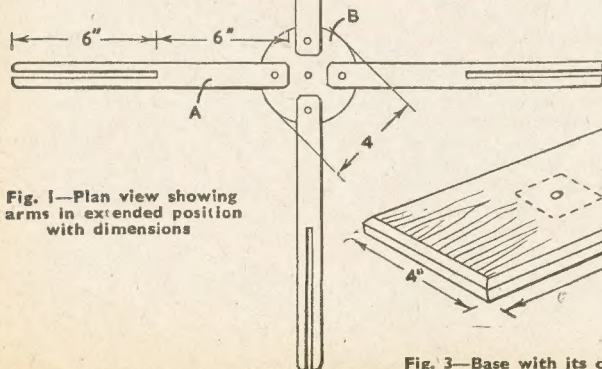


Fig. 1—Plan view showing arms in extended position with dimensions

of the base so that when it is cramped to the table no damage may be done to the polished surface.

Centre Pillar

The upright C which is screwed to the middle of the base is a simple piece of square wood with 1 in. sides and 5 ins. long. A hole will be drilled down the centre of this piece to a depth of about 3 ins. to take the spindle round which the platform and arms revolve. For the platform B, a piece of $\frac{1}{2}$ in. wood—preferably plywood—is required 4 ins. diameter with five $\frac{1}{4}$ in. holes drilled through as shown in the plan Fig. 1 and in Fig. 2.

A stout long wire nail will answer the purpose of a spindle. Or, of course, the platform may be held by a roundhead screw with a washer added beneath the head. A detail of this is given in Fig. 5.

The arms A are 12 ins. long and can be 1 in. wide and $\frac{1}{4}$ in. thick. Mark the slots in these carefully, and make a shade wider than $\frac{1}{4}$ in. when cutting them with the fretsaw so that a $\frac{1}{4}$ in.

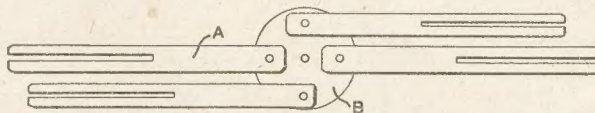


Fig. 2—The arms folded parallel when not in use

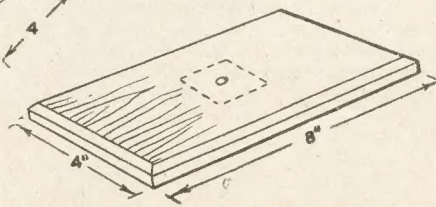


Fig. 3—Base with its chamfered edge

A simple base for the article is shown in Fig. 3. This may consist of deal or perhaps a better class wood, about $\frac{3}{8}$ in. thick with a wide chamfer worked round the four edges as shown. A piece of green baize should be glued to the underside

bolt will slide smoothly along the groove. At a distance of $\frac{3}{8}$ in. from the solid end of each arm drill a $\frac{1}{4}$ in. diameter hole to take an inch or a $1\frac{1}{4}$ in. long bolt. This, when inserted through the arm and the top B, should be as the detail Fig. 5. The three washers between the layers of wood are also shown.

Spool Holders

The uprights which support the wool during winding may consist of spools taken from ordinary No. 120 film camera spools. These metal spools can be filed and adapted to take a $\frac{1}{4}$ in. bolt with nut and washers complete.

Another satisfactory way to make the uprights however, is to get eight ordinary cotton reels about $1\frac{1}{4}$ ins. long and $1\frac{1}{4}$ ins. middle diameter. Clean off one projecting end of each reel, then glue them together in pairs, one above the other, as Fig. 6 shows. Next obtain four 3 in. bolts and pass them through the reels. Add a thin metal washer, and finally tighten up the nut. The reels may simply be slid along the arms to whatever position is required according to the length skein to be wound off.

Cleaning and Finishing

A cleaning of all the wooden parts should be given and the whole then painted up in bright enamel or ordinary oil paint or given a coat of stain and varnish. Should the arms and the base be of mahogany then french polish should be applied with the polishing shoe or a brush.

In finishing the article see that all parts work smoothly and easily. Wooden parts working on each other can be made to "view" better if the

graphite of a pencil is rubbed on. This applies to arms and spools.

Take care too with the finish because a good piece of work can be spoiled by bad polishing or painting.

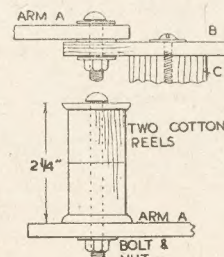


Fig. 5—(above)—The arm joint to pillar

Fig. 6—Spool fixing

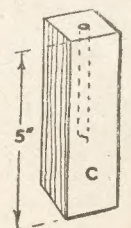


Fig. 4—The centre column

How to build realistic goods wagons for your MODEL RAILWAY

THE construction of model railway rolling-stock is based upon certain well-established underlying principles, which remain almost unaltered, in the construction of any form of vehicle. These notes, though dealing primarily with the building of simple open goods wagons, will be found equally useful (with a few slight modifications) during the building of longer passenger vehicles.

It will be easily understood that it is those parts which are out of sight which are by far the most important to the construction of any vehicle. They are the foundations upon which the upper structure is eventually erected, and are known in railway circles as the "underframes".

It is to them that the bodywork is fixed above and the axle-guards below. They are the only part of a vehicle which carries any 'working' parts.

In Fig. 1 is depicted (full-size for "OO" gauge) the layout of the underframes for a wooden-framed



A standard 10-ton open wagon

wagon or van, and it will be seen that they are comprised of five main members, viz. two headstocks or buffer-beams (AA), two main-frames or sole-bars (BB), and a transverse stretcher-bar (C).

The headstocks carry the buffers, which should be located 40 millimetres (1-9/16in.) apart—the buffers being either of the die-cast variety or the turned brass, super-detailed type. Oval buffers are the best for running, as vehicles fitted with them do not "buffer-lock" whilst being pushed round curves, and thus become derailed.

To the sole-bars are fitted the axle-guards which carry the wheels, the axles being of the correct distance apart to give the vehicle its

An assortment of wagons will improve the appearance of any model railway layout.



correct wheelbase. The distance between the inside faces of the two sole-bars (X on the diagram) cannot be definitely stated, as it depends directly upon the make of wheels, axles and axle-guards being used. The distance is usually about 45mm. (1 3/4 in. full), which allows about 2mm. for sideplay in the axles.

Headstocks

Returning to the headstocks. These are cut from 1/2 in. by 1/2 in. wood (satin walnut for preference) to a length of 2 1/4 ins. each, being shouldered at each end as shown to take the ends of the sole-bars. The latter are formed of 1/2 in. by 1/2 in. stuff on edge, cut to 1/4 in. shorter than the overall length of the underframe to allow for the remaining 1/8 in. of the headstocks at each end.

The stretcher (C) from 1/2 in. by 1/2 in. material, is cut to exactly the same length as the distance between the shoulders on the headstocks. One stretcher is quite sufficient if the vehicle is not longer than about 5 ins., but on passenger vehicle underframes for models of 50ft. to 70ft. coaches, it will be advisable to use half-a-dozen or more to ensure rigidity.

The axleguards are screwed to the insides of the sole-bars where shown, using 3/16 in. by 00 round or countersunk head wood-screws. Take great care not to split the sole-bar during the process. Every effort should be made to get the wheelbase absolutely accurate on each side of the vehicle.

This is perhaps best achieved by marking the longitudinal centre-point on each sole-bar, and then halving the wheelbase on each side of the centre-line; marking in these two latter points. As an additional pre-

caution against error, the two sole-bars may be drilled with a needle-drill (where the axle-guard screws are to go), drilling through both bars at the same time; thereby ensuring perfection.

Gauge "O" brass or cast white-metal axle-guards can be purchased from almost any model shop, and any slight variation in shape or size can be easily counteracted by suitably spacing the sole-bars on the headstocks, as already noted.

It cannot be too strongly stressed that it is far better to make a model of an actual vehicle, than merely to construct a "wagon" of any size or shape.

Getting Details

It is a good plan to build a wagon body as indicated in Fig. 2, which is a good standard size, and paint, line and letter it in keeping with some particular wagon to which you can get access to at your nearest station—using a notebook for the purpose of jotting down any odd details.

After the underframe is assembled, and all glued joints have set hard, the two wedge-shaped grooves in the headstocks should be cut out to allow the draw-bar and coupling-hook to be fitted (shown dotted at Y, Fig. 1). The draw-bar is pivoted to the floor of the wagon, which, together with sides and ends has yet to be made.

The sides, ends and floor of the wagon should if possible be made from 1/16 in. plywood (of which odd scraps are often offered for sale) as this material is almost the exact scale

(Continued foot of page 220)

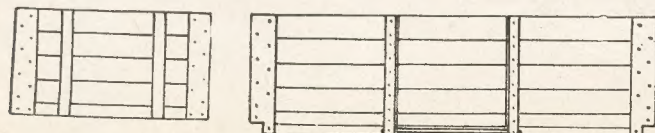


Fig. 2—End and side pattern for "OO" gauge wagon

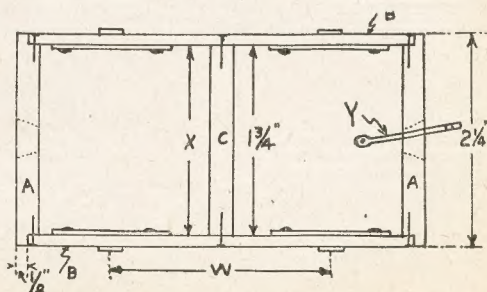


Fig. 1—Full size "OO" plan and parts

Turn the roller and out comes a match each time in this NOVEL MATCHBOX

“ONE match at a time” is the motto of this novel matchbox. A half-turn of the small knob on the side delivers one match on to the tray ready to be struck on the front of the case. The dead match can then be put tidily away in the container underneath the slide.

While the roller is being turned half-way round, another match drops into the other slot ready to be delivered in the same manner.

Main Container

The main framework of the matchbox here described is made of $\frac{3}{16}$ in. wood, but any other thickness can be used if you make the necessary alteration in the measurements. A piece of wood $6\frac{3}{4}$ ins. long and 3ins. wide is cut to the shape shown for the back, or if you like you can make a different design of your own. A small hole is made in the top for hanging.

The two sides are 5ins. long and $2\frac{3}{8}$ ins. wide at the bottom. The top part is cut 2ins. wide where the front is to be fixed. One side also has a triangular piece cut out of the bottom to leave room to put the used matches in. It does not matter which side is left open.

As the average length of a match is $1\frac{1}{4}$ ins., we shall make the inside of the box 2ins. wide, and if we make the depth 2ins. also, we shall have a box which is exactly square inside.

The Rollers

It would be best to get the rollers made next before attempting to glue up any of the case. From the side view it will be seen that three rollers are needed made from $\frac{1}{2}$ in. dowel rod nearly 2ins. long. The centre roller

has two grooves cut exactly opposite to each other for the matches to fall in easily. An average match is $\frac{1}{10}$ in. square, so if the slots are made $\frac{1}{8}$ in. wide and $\frac{1}{8}$ in. deep, we shall have a nice easy fit.

Remember to cut out a little at each end of both slots for the heads of the matches. By having the two ends cut out, it does not matter which way they are placed in the top of the box.

The two side rollers are covered with either a piece of thin felt or of cycle inner tube. This is very carefully glued on to the wood making the join as close and neat as possible.

Accurate Fitting

All three rollers have pivots in each end and in order that they may revolve smoothly, these pivots must be exactly in the centre. This is very important and a little extra trouble spent doing this now will be well worth while. Small wire nails with the heads cut off and filed square will make nice pivots.

Drill holes to take them about $\frac{1}{2}$ in. deep and slightly smaller than the nails, thus making a tight fit. Lightly tap in, leaving $\frac{3}{16}$ in. projecting which is the width of the sides of the box. Five will be wanted. One end of the centre roller is drilled to take a piece of $\frac{1}{4}$ in. dowel rod, which will project enough to fit the knob on.

We can now assemble the parts we have so far made. The rollers must have holes in which to turn drilled in the sides of the box. They are exactly half-way down and should be made large enough for the pivots to turn easily but not to shake about. The side rollers make just light contact with the centre one.

Place the pivots in their proper



holes and glue the two sides to the back. A few panel pins can be used if thought necessary. See all the rollers have just a little side shake and turn easily. Rub spindles with pencil “lead” to reduce friction.

The Hopper

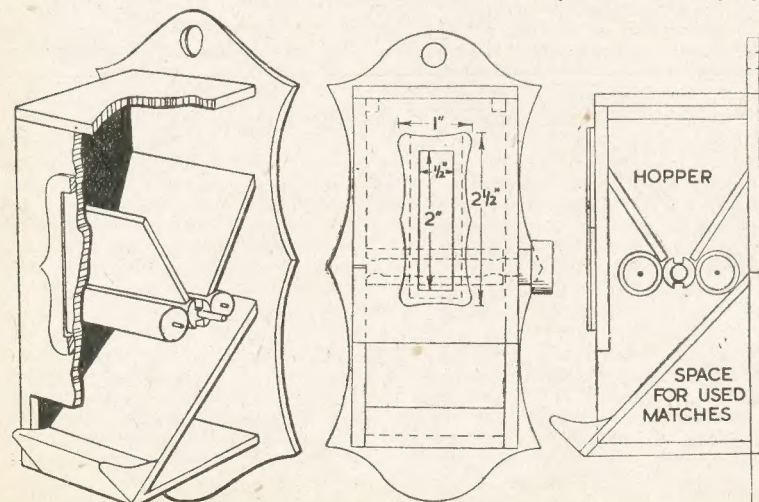
When the glue is dry, the two thin pieces of wood to form the top hopper can be cut to fit. The size or angle of slope is not too important—about $1\frac{1}{2}$ ins. long and the width of the box, which should be 2ins. The slide at the base can also be cut from the same material. This part is $3\frac{1}{2}$ ins. long and on to the bottom edge is fixed a slip of wood hollowed out to form a tray to catch the falling matches.

These three pieces can now be glued in position as shown in the side view. The bottom ends of the hopper should go as close to the rollers as possible without actually touching. The base also can be cut to fit and glued in position.

The cutting and fitting on to the front of the “striker” is quite simple. Fairly thin wood is needed—just thick enough so the side of a matchbox can be slid in easily. When this gets worn out, another piece can be slid or glued on.

A lid which can be lifted off for filling the box is only needed to complete the job. The final treatment of the wood is left to your particular fancy—just plain, or polished or even enamelled.

Besides being very useful hung up near the gas stove or some other place, it is quite attractive and easily made from odd pieces of fretwood or plywood.



Cutaway view to show interior mechanism

Front and side, inside details with measurements

A Craftsman's Notebook



Museums and the Model Maker

MUSEUMS can often provide model makers with ideas for things to make and help them to perfect their models by examination of originals. In one museum or another one can see at first hand actual spinning wheels, early bicycles, implements, furniture—in fact, scores of things well worth reproducing in miniature.

Among the many interesting features of the Castle Museum at York, for instance, I saw a real stage coach. An exhibit such as this, and the Hansom Cab also on show, might well inspire the home craftsman in search of ideas. A design for a Stage Coach is now available from Hobbies Ltd., of course, but that published for a Hansom Cab some years ago is now out of print.

In this same collection one can see what an old-time street was like, with its shops and cobbled roadway, made even more realistic with various types of carriage complete with full-scale model horse between the shafts.

Making Putty

YOU can make your putty by mixing a little boiled linseed oil with paris white.

Spread the whitening over a small area on a board and add the linseed oil gradually, mixing them together with a blunt knife. The oil should be used sparingly, as only a little excess soon makes the putty too soft and oily.

When all the whitening has been gathered up and worked in with the knife the best way is to take the putty in the hand and knead thoroughly together till smooth, rather like stiff dough, the more it is worked together the better.

To ensure a good hold a touch of paint ought first to be applied to any surface—the edge of glass, small holes for filling, and so on—that is to receive the putty.

Repairing Inside Walls

AFTER cleaning them down, walls to be re-decorated ought to be looked over for any small holes and places where bits of plaster are likely to come away. If any are seen, attention is desirable to keep the walls sound and to preserve their appearance.

Loose bits of plaster should be first scraped away and the holes sprinkled with water, then filled up with plaster of paris mixed to a paste with water. This soon sets, so it should be used as soon as possible, making only enough for immediate use.

If a hole is extra large, quite a good idea is to partly fill the inside with bits of brick. Another useful idea, in cases where walls are to be distempered, is to colour the plaster with a little of the distemper.

Liming the Garden

AN amateur wishing to get the best out of his garden wants to know how to test soil to ascertain whether it contains sufficient lime, and if there is a deficiency, what quantity to use.

A test can be made with hydrochloric acid. Take a small sample of soil from different parts of the plot and mix together, half filling some vessel such as a discarded cup or jar which will not be wanted again. Then pour on a little hydrochloric acid—about as much as would fill, say, a small egg cup.

If there is brisk effervescence, the lime content is sufficient. But if there

is only slight fizzing or none at all, then there is little or no lime present.

Hydrated lime is sold in convenient packets for garden purposes, a useful rate of dressing being a pound to the square yard.

Notes from the News

ON show at an engineering exhibition was a piece of rope 3,000 years old. Made of bullrushes, it was found in Egypt attached to a 60-ton block of limestone. The fact that the stone was on rollers suggests it had been prepared for hauling to the Pyramids.

A collection of lamp posts sounds quite original. It is reported that there is a specialist in this line.

First international stamp exhibition to be held in Britain since 1923 is planned for May 1950 in London. The exhibition was intended to celebrate the centenary of the adhesive postage stamp, but had to be abandoned because of the war.

A Great Experimenter

WHILE binding up some volumes a bookseller's errand boy became so fascinated with an article on electricity that he built for himself a small battery from an old bottle. That little effort was a first step towards a brilliant future of scientific research—for the boy was Michael Faraday.

His mother, a farmer's daughter, his father a blacksmith, Michael Faraday was born in 1791 at Newington Butts, near London. When he died in 1867 he had to his credit more than 16,000 experiments.

It was in 1812, by which time he had become apprenticed to a bookseller, that he attended a lecture by Sir Humphry Davy. This so interested him that he later saw the scientist and told him how keen he was to devote his life to science. The result was that he became an assistant in the laboratory of the Royal Institute, where he succeeded to the position of professor of chemistry when Davy retired in 1827.

The Craftsman

Model Railway—(Continued from page 218)

thickness for 2in. to 2½in. planking, as used in the prototype wagons. The ½in. plywood, also obtainable is much too thick, but has the advantage of being easier for the beginner to handle in many ways, and it makes up into a model which will stand much rougher handling.

The sides are cut 4-5/16in. by 1½in. with the two parallel grains of the ply going lengthways. Two ½in. by ½in. nicks are cut from each of the bottom corners to allow the sides to drop over the ends of the headstocks.

It will be noticed that the height of the ends (1½ins.) is less than that of the sides. This is so they should sit down on to the upper faces of the headstocks, whilst the lower edges of the sides overlap the sole-bars by ½in.

In assembly, the sides overlap the ends, not vice versa. If this is wrongly done, the body will be too narrow and too long. The corners may be glued and further strengthened by a wrapping of gummed brown-paper strip both inside and out—if 1/16in. plywood is being used. If ½in. stuff has been decided upon, then the sides may be pinned to the ends, using "Lilliken" pins for the purpose.

When all is set and strong, the body may be set over the underframe, placing the latter with the draw-bar recesses uppermost, and pinning the body down to the headstocks and central stretcher. 3/16in. by 00 screws may be used if desired.

"Planking" may now be scribed with a blunt knitting-needle or the

back of a penknife blade, corner plates and all other "iron-work" added according to the notes made of the actual wagon being modelled. Buffers and draw-hooks are next fixed in place, and the whole body carefully rubbed down with No. 00 glasspaper.

Matt-drying paint should be used for painting, and it should be applied very thinly. Never attempt to effect a perfectly-covering coat with one application, but always apply two or three thin coats—each of a slightly different shade—finishing up with the desired prototype colour. Lettering may be carried out by the application of transfers (some model aircraft transfers are equally useful for wagon-work) or it may be done by hand with a fine brush and a steady hand.

Some interesting notes for the Handyman on MAGNETISING

MAGNETISM, often picked up by tools coming in contact with a powerful permanent magnet, can be a bit of a nuisance, more particularly in the case of a screwdriver. The accurate timekeeping of a watch, moreover, can be affected by magnetism in the steel parts of the mechanism.

How, then, to demagnetise such articles? While the magnetism in the screwdriver can be driven out by the application of heat, this cannot, obviously, be done with the mechanism of a watch. It is, anyhow, a rather drastic way of removing magnetism from a screwdriver, or any other metal article into which some magnetism has been induced through friction with a magnet.

Heat, while a demagnetiser, has an alternative—a magnetiser. The latter is capable of creating magnetism in iron or steel, and can be used to demagnetise these metals. The magnetiser is nothing more than a special coil, a lamp (or a transformer), a switch and an A.C. supply from a mains.

Making the Coil

As most readers know, when an electrical current is passed through a coil of insulated wire, a magnetic "field" is set up within the coil. If the coil has an iron core, the core becomes magnetised, but only during the time that current is flowing through the coil of wire.

This is known as electro-magnetism. By building a special coil and connecting it to an A.C. mains through a transformer, or a lamp we can, by suspending a watch, etc. in the coil, magnetise the iron and steel parts by suddenly switching the current on and off.

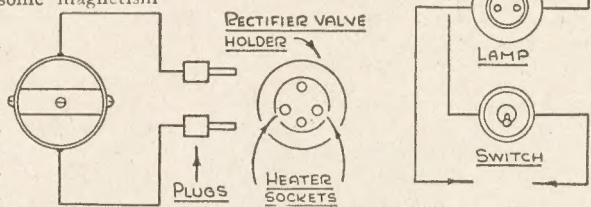
On the other hand, by switching on the current, then lowering the watch quickly into the coil and withdrawing it slowly out of the magnetic field, we can demagnetise the iron and steel parts.

There are two constructional methods for building the simple apparatus. The easiest plan is using a lamp instead of a small transformer. The latter is a static, or mains type, having a secondary supplying 4 volts at 3 amps. or thereabouts.

The coil, if the lamp is used, consists of a cardboard tube about 3ins. in diameter and 4½ins. long, on which is wound 3 ozs. of 32 s.w.g. enamelled or cotton-covered wire. A cardboard tube is easily made by damping 4½ins.

wide strips of thin stuff and gluing them around a former, such as a bottle. The damping helps to make the card more pliable, and in the drying a good, tight, firm coil tube is ensured.

Paste could be used, but the strips will need to be bound. Joints in the strips should be level. Instead of making a cardboard coil, use a 1 lb. glass jam jar. The windings of wire will need to be anchored with adhesive tape.



Wiring diagram for a lamp in series with the coil and switch, and a simple alternative arrangement

Thick wire must be joined to the ends of the finer wire on the coil tube to serve as leads for connection to the switch and lamp, as shown in the diagram. The coil tube, if made as described, will need to be thoroughly dry. If the cardboard is thin, do not dampen it. Smear it with tube glue or brush on a shellac polish. The latter makes an excellent adhesive. The tube should have a thickness of about ¼in.

The coil, lamp and switch are mounted on a suitable wooden base. The lamp, of course, is fitted into a batten holder. The wire from the lamp holder and switch should be flexible, rubber-covered stuff. The ends are connected to an adapter or a plug.

Using a Mains Transformer

If you possess a mains transformer having a secondary winding giving an output of 4 volts, and desire to connect the coil to this component, some modification in the coil construction will be necessary. The same coil tube is used, but the winding should consist of 24 s.w.g. enamelled or cotton-covered wire. You will need to put on about 2 ozs. of this wire. It is, by the way, about 1/32in. thick. The 32 s.w.g. coil wire previously mentioned is much finer, being about half of 1/32in.

While enamel wire may be used in both cases, it is, perhaps, better to use cotton-covered stuff. Enamel is liable to peel or crack, and if utilizing old coil wire, the bared portions may cause a short-circuit, thus spoiling the

magnetism that is necessary within the coil.

When deciding on the thickness of cotton-covered wire, note that it is the wire itself, and not its protective covering, that is measured. Be sure, then, to bare one end of the wire to find its proper thickness.

Wiring the Transformer

To use the transformer, connect the ends of the coil to the 4 volt secondary tapping. The primary winding on the transformer has one of its leads attached to a plug or adapter, the other lead being brought through a switch to the second terminal on the plug or adapter.

If you wish to experiment and save using a separate transformer and switch, this can be done if you own an A.C. radio set. All you will need is the coil, with two plugs affixed to its ends, as shown in the second diagram.

All you have to do is to remove the rectifier valve from its holder and insert the plugs into the heater sockets. The voltage at these sockets is usually 4 volts or 6 volts, at 1 amp. to 3 amps. Note, by the way, an A.C. set is mentioned—not a universal A.C./D.C. set.

An A.C. set is very like a battery set, particularly the older types having four-pin and five-pin valves and valve holders. The rectifier valve, if a four-pin type as shown, has two filament (heater) pins, the anode and grid pins being plate connections. The valve has two plates (there is no grid) for giving full-wave rectification. If there is a central pin, this is the cathode. Such a valve is an indirectly heated type. The four-pin type is directly heated. It makes no difference to the heater connections. Therefore, one may try connecting the coil to the rectifier valve pin sockets to get a simple, convenient 4 volt supply of A.C. current. D.C. current cannot be used in this way of course.

Insulation

If you make use of a lamp, and the coil intended for this purpose, mains voltages are present in the coil, and to insulate it, the coil could be placed in a jam jar and affixed in it by melting wax and pouring it in around the outside of the coil. This means that the jar must be slightly larger than the outside diameter of the coil.

A few copies of the
HOBBIES 1949
HANDBOOK are
still obtainable



ALTHOUGH the United States of America have been issuing rather more stamps than seems justified by the postal needs yet one that has appeared is the subject of the first illustration this week. It celebrates the Centenary of the American Medical Association and that should surely be called a subject worthy of commemoration.

The stamp is a reproduction of a well-known picture that hangs in the Tate Gallery in London and is called "The Doctor" which was painted by Sir Luke Fildes. If we look around in the stamp album we shall be able to find many more stamps portraying medical subjects.



"The Doctor" from the U.S.A.

Luxembourg comes quickly to mind, for 1935 saw the set issued to help an International Fund for Intellectuals and one of the stamps showed a view of an operation in progress. The Belgian Congo has quite a number of medical scenes for us, chiefly connected with the work of missionaries.

Leprosy

Egypt too has had a number of stamps connected with medicine. In 1928 there were two stamps for the Medical Congress, one showed "Im Hotep" and the other Mohamed Ali Pasha. In 1937 there was the ophthalmological Congress showing "Nekhet"—the sacred eye. A year later the Leprosy Research Congress was held and three more stamps came out, each bearing a sprig of Hydnocarpus, a plant from which oil is extracted to treat this disease.

Red Cross stamps have been issued by the hundred and these would need an article to themselves. So here we will only mention two of them—the Swiss stamp bearing the portrait of Jean Henri Dunant and the Belgian stamp with Florence Nightingale. Dunant, you may know, was the founder of the Red Cross.

The most distinguished medical set was that issued by Austria in 1937. In this no less than nine Austrian doctors are shown. While the

portraits are very fine, as they are not well-known people in this country, we shall not illustrate any here.

There are many stamps which have been issued to assist in the funds for combating tuberculosis. These bear the well known symbol of the cross of Loralne. Our next illustration is of the man who discovered the tubercule bacillus—Robert Koch. He was born in 1843, and although he studied to be a doctor he really wanted to be an explorer.

He did actually become one, but of a different type from what he dreamed about. He qualified as a doctor and went from one village to another until he came to Woolstein in East Prussia. Here he settled and on his 28th birthday his wife gave him a microscope in the hope that it would make him more contented. This was the beginning of his great work.

Tuberculosis

At first he just potted about looking at everything and anything. Then one day he looked at the blood of a sheep that had died from anthrax and became interested in the rod-like objects that he saw. Some of these he isolated and injected into some mice and found that they very soon died of a disease just like anthrax. If another mouse was injected with this blood then that one died too, even if the blood was kept for a long time before injecting.

Consequently he suggested that if an animal died from anthrax the carcase should either be burned or else buried very deep to prevent the spores being left in the field for another animal to pick up.

Next he set out to explore that terrible disease about which little was known—tuberculosis. His efforts to find the germ, bacilli or whatever it was that carried it, were very thorough and he would not tell anyone anything until he was abso-



Robert Koch



Dr. Carlos Finlay

MEDICAL SCIENCE ON STAMPS

lutely certain of his facts. He found out what he set out for and was hailed by everyone as a great man. But he did not stop—he immediately set out to probe the mysteries of cholera and isolated the cholera microbe.

Yellow Fever

Quite close to Danzig in the stamp album you will generally find Cuba. In 1934 this Republic issued two stamps to commemorate the anniversary of the birth of Dr. Carlos Finlay. This man, although he was said to be a terrible muddler, guessed right about yellow fever—namely that the disease was carried by a special kind of mosquito. The third illustration shows us a portrait of Dr. Carlos Finlay.

In passing it is as well to remind readers that Cuba issued a stamp bearing the portraits of Pierre and Mme. Curie, the discoverers of radium, the chemical used in the treatment of cancer.

Now Carlos told his theory to a



From Luxembourg—The Operation

man who has also had honour in the stamp album—a Dr. Walter Reed. He was shown on the "Famous American Series" of 1940, the 5c value. In 1900 Reed was sent to Cuba to try to deal with yellow fever. Unfortunately for science (or is it fortunately?) animals do not take yellow fever so that it was necessary to experiment on human beings. They had the mosquitos, Finlay had given them the eggs.

First a James Carroll permitted himself to be bitten by a mosquito; he had yellow fever and recovered. One of the experimenters was accidentally bitten and died, so that shows the danger these men were experiencing. It was proved that yellow fever was carried by the mosquito.

In a mosquito-proof house bedding in which patients had slept was used by healthy men and they did not get the disease, until they allowed themselves to be bitten.

PETS, by Harper Cory. 48 pp. of practical tips on how to look after pets of all kinds. 61 illustrations. 1/6 from booksellers, or post free 1/8 from—Mayflower Publishing Co. Ltd., 17 Farringdon St., E.C.4.

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HOME TOYMAKING ! Complete instruction book, beautifully illustrated, Directory of Supply sources including exclusive list of toy buyers, 5/6.—King's, 31 Northfield Avenue, Ealing, W.13.

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MODELS—you can make lasting stone-hard models with Sankey's Pyruma Plastic Cement. Supplied in tins by Ironmongers, Hardwaremen and Builders' Merchants. Ask for instruction leaflet.

TRANSFERS for decorating toys, trays, furniture, fancy goods. List and samples free. Flowers, pixies, dogs, nursery rhymes.—H. Axon Harrison, Jersey.

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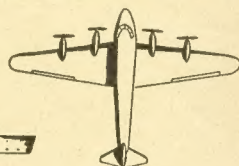
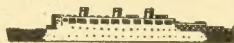
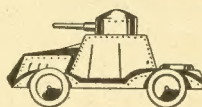
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